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ty. He had discovered, in the track of the tornado, a series of points of greatest destruction, which succeeded each other at constantly increasing distances. He endeavored to account for the ascertained facts, by referring them to the collision of a northwest and a southwest wind, of which he thought there was satisfactory evidence.

Dr. A. A. Gould stated some additional observations made by him at the time of the occurrence of the tornado.

Mr. Guyot, who had examined a part of the track of the tornado with Mr. Blasius, testified to the accuracy of his observations, but did not coincide with him in his theoretical views.

Professor Peirce thought that some of the phenomena of the tornado were incompatible both with Espy's and with Redfield's theory of storms, and offered some objections to the explanations of Mr. Blasius.

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**Three hundred and fifty-first meeting.**

November 4, 1851. — MONTHLY MEETING.

The PRESIDENT in the chair.

Professor Agassiz gave an account of two families of fishes not before observed in the United States, the Myxinoids and the Erythrinoids, and described a new genus, *Phyllobranchus*.

Professor Agassiz also communicated some new views in regard to the geological position of the coal at Mansfield, Massachusetts, which led to an animated discussion, in which Mr. Bouvé, Dr. C. T. Jackson, and Professor Horsford took part. He advanced the opinion, that the slate rocks at Nahant are metamorphosed shales of the Mansfield coal formation; that the sienite which overlies them is not the cause of the metamorphic change, and is not an intruded rock, but is itself a metamorphic sandstone of the coal period.

Mr. Bouvé remarked, that, if these views were correct, heat must have been transmitted through the coal-bearing rocks sufficient to melt down and render liquid or semi-liquid the

strata superincumbent on them, and enable their elements to rearrange themselves and crystallize, while, at the same time, the shales were not essentially changed in structure. He could not conceive of so intense a heat passing through the shales without annihilating every trace of organic life in them; he should certainly not expect to find any carbon except in the form of graphite.

Professor Agassiz replied to the last observation of Mr. Bouvé, that the coal in these rocks is partly graphite, very similar to that found in Worcester.

Dr. Jackson stated several facts which he considered irconcilable with the views maintained by Professor Agassiz. He said that no trace had ever been observed of sandstone passing into sienite, and that sandstone contains no potash or soda, while these substances exist abundantly in sienite. He dissented from the opinion formerly advanced by Mr. Agassiz, that the nodules found in the rocks at Nahant are the remains of corals; and stated that they had been found, by microscopic examinations, not to be organic remains.

Professor Agassiz endeavored to account for the presence of potash and soda in the sienite, by supposing them to have been derived through the agency of heat, from the coal included within the slate. He also stated, that he had found one of the nodules to possess the structure of an *Astræa*.

Dr. Jackson replied, that sandstone is an exceedingly poor conductor of heat, and may be heated to a white heat without undergoing chemical change; and he thought it impossible that it should have been changed through its entire thickness into sienite by heat,—potash and soda transmitted through slate from underlying coal.

Professor Peirce remarked, that the recent solar eclipse of July 28, 1851, had proved quite a triumph for the new lunar tables employed in the construction of the Nautical Almanac, in comparison with those of Burckhardt, with which the European ephemerides were computed. Both in this country and in Europe the errors of theory had been reduced, from

40, 50, or even 65 seconds, to 10, 15, or 20 seconds. He stated that some additional corrections had been received from Mr. Longstreth, which reduce the errors still further, generally to less than 10 seconds, and sometimes to a fraction of a second. Mr. Longstreth's corrections have been adopted in the computation of the Nautical Almanac, which is in preparation for the government of the United States.

Professor J. Wyman made a communication on the metamorphosis of the nervous system in frogs.

Professor Horsford presented a paper, entitled "A Theory explanatory of Internal Fire in the Heavenly Bodies, and of Light and Heat in the Case of Luminous Bodies," by the Rev. Edmund B. Cross.

On motion of Professor Horsford, it was voted, that the paper be referred to the Rumford Committee.

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**Three hundred and fifty-second meeting.**

November 12, 1851. — QUARTERLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary laid before the Academy letters of acceptance from Professor Johann Müller and Professor Johann Friedrich Encke, both of Berlin, Professor Benjamin Silliman, Jr., of New Haven, and John Le Conte, M. D., of New York, in reply to notifications of their election as Fellows of the Academy.

The Academy then took up the nomination list.

Mr. T. S. Hunt, of Montreal, Lower Canada, was elected a Fellow of the Academy.

"*Voted*, That when the Academy shall adjourn, it adjourn to meet in three weeks from this time."

**DONATIONS TO THE LIBRARY,  
FROM JUNE, 1850, TO DECEMBER, 1851.**

*United States Government, through Hon. R. C. Winthrop.*

Letter of the Secretary of the Treasury, transmitting the Report of the Superintendent of the Coast Survey, showing the Progress of

#### ERRATA.

Insert "as observed" before "at Castle William," sixth line from the bottom of page 259.

Instead of a dash before "potash," page 271, eighth line from the bottom of the page, substitute a comma after that word.

Substitute a period for the note of admiration on page 285, twelfth line.

The experiment exhibited by Mr. Guyot, and described on page 284, where it is credited to Professor Snell, is identical with that performed by M. de Maistre in 1832, of which an account is given in Peltier's work, "Des Trombes," page 11.